

Claims

1. A PTC element module of a pre-heater for vehicles including a PTC element, comprising:

5 a positive terminal (130) composed of two sheets, an upper sheet of which has a fastening hole (132) and upward bended ribs (131) formed at opposite edges of the fastening hole;

 a ring-shaped insert insulator (120) inserted between the ribs (131);

10 a PTC element (140) inserted into an inside of the insert insulator (120), a bottom surface of which is in contact with a lower sheet of the positive terminal (130);

 one heat fin assembly closely fastened to one surface of the PTC element (140);
 another heat fin assembly fastened to the other surface of the PTC element (140) through the medium of a positive terminal (130) and an entire surface insulator (150); and

15 a fastening insulator (170) for binding together the two heat fin assemblies, the PTC element (140), the positive terminal (130) and the entire surface insulator (150).

20 2. The PTC element module according to claim 1, wherein the heat fin assembly is formed of a corrugated heat fin (200) fastened to one heat fin plate (220) or (230).

25 3. The PTC element module according to claim 1, wherein the fastening insulator (170) comprises a longitudinally extending thin and long member and a "C" shaped insert member formed inward from the thin and long member.

4. The PTC element module according to claim 1, wherein the PTC element (140) and the insert insulator (120) have rectangular shapes.

30 5. A pre-heater for vehicles comprising:

 the PTC element module (100) according to claim 1 or 2;

a heat fin assembly (260) disposed parallel to the PTC element module (100);
a negative terminal (300) disposed parallel to the heat fin assembly (260);
frames (600) and (900) respectively fastened to both lateral ends of a combined
body including the PTC element module (100), the heat fin assembly (260), and the
5 negative terminal (300); and

housings (400) and (800) respectively fastened to both longitudinal ends of a
combined body including the PTC element module (100), the heat fin assembly (260),
the negative terminal (300), and the frames (600) and (900).

10 6. The pre-heater for vehicles according to claim 5, further comprising fastening
means (500) for binding together the PTC element module (100), the heat fin assembly
(260), and the negative terminal (300) at a longitudinal middle position thereof.

15 7. The pre-heater for vehicles according to claim 5, wherein the frames (600)
and (900) are fastened to a heat fin (200) of the heat fin assembly (260) through the
medium of a fin protector (700).